STUDIES IN SOUTH AND CENTRAL AMERICAN ACRIDINÆ (ORTHOPTERA), WITH THE DESCRIPTIONS OF A NEW GENUS AND SIX NEW SPECIES.

BY JAMES A. G. REHN.

The subfamily treated in the following pages is usually termed the Truxalinæ, but the resurrection of the Old World Linnæan genus *Acrida* necessitates the use of the name Acridinæ.

Of this subfamily by far the majority of the South and Central American genera have been studied in this connection and numerous opinions and conclusions regarding their relationship are given in the following pages, while several genera, or subgenera, have been considered untenable and one new one proposed. The consideration of several wrongly identified or overlooked species caused a shifting of generic names, which necessitated in one case a new generic name.

Twenty-two genera have been considered in more or less detail, and sixty-three species, of which six are new, have been examined. The material examined numbered six hundred and twenty specimens, of which two hundred and sixty-seven were from the Academy Collection, three hundred and twenty-eight from the Hebard Collection, and twenty-five from various sources.

I wish to express my thanks to Mr. Hebard for the privilege of examining the material from his collection.

HYALOPTERYGES.

HYALOPTERYX Charpentier.

1845. *Hyalopteryx* Charpentier, Orthopt. Descr. et Depict., tab. 46.

Type.—*H. rufipennis* Charpentier.

From its closest allies *Hyalopteryx* can be separated as follows: from *Radinotatum* by the presence of well developed tegmina and wings, the caudal expansion of the pronotum and the much shorter rostrum and less produced head; from *Achurum* by the more robust form, the caudal expansion of the pronotum (more or less pronounced according to the sex), the much broader tegmina and wings as well as the shorter, blunter rostrum and less produced head; from *Eutryxalis* in the longer, slender limbs, the somewhat broader tegmina, the shorter

rostrum, and the more fenestrate wings of the male; from *Truxalis* in the longer, more produced rostrum, the more angulate caudal margin of the pronotum, the slender caudal limbs and the broader, less subequal tegmina; from *Orphula* in the characters which separate it from *Truxalis*. The genus *Hyalopteryx* appears to connect two extremes of the series, one extreme represented by *Radinotatum*, a quite peculiar type, and *Achurum*, and the other by *Truxalis* and *Orphula*, *Eutryxalis* apparently sharing the intermediate position, but really being closer to *Truxalis*. The sequence of genera which appears most natural in the *Hyalopteryges* is:

Radinotatum McNeill.
Achurum Saussure.
Hyalopteryx Charpentier.
Eutryxalis Bruner.
Truxalis Fabricius.
Orphula Stål.

Hyalopteryx rufipennis Charpentier.

1845. *Hyalopteryx rufipennis* Charpentier, Orthopt. Descr. et Depict., tab. 46. [Brazil.]

Sapucay, Paraguay. December 13, 16, 19, 1904. March 7, 1902. February 13 and 15, March 6, 7 and 9, 1905. (Foster, Hebard Coll.) Eleven ♂♂, eleven ♀♀.

These specimens appear from Charpentier's description and figure to be the same form as he called *rufipennis*. The description particularly mentions the distinct lines on the metazona, and states that the lateral carinæ are similar to the median, which would hardly have been said if the metazona was irregularly lineato-rugose and the lateral carinæ faint and strongly expanded on the metazona, as in the new species here described as *H. asinus*. Of the caudal femora he says: "Die Hinterschenkel . . . . oben eine fein erhabene Linie, die vorn am Knie in eine ganz kleine Spitze ausgeht, woselbst seitwärts zwey weit grössere hervorragen, wie Stacheln." From this and the comparative proportions of the structures mentioned above and the subgenital plate as figured in his plate it is very evident that the Sapucay specimens are either Charpentier's *rufipennis* or a very closely related new species. Burr's *H. exaggerata*,[1] the only other previously described species, possesses elongated genicular structures as in my new *asinus*.

The series examined is quite uniform, a little variation in size being

[1] *Trans. Ent. Soc. London*, 1902, pt. II, p. 183. [Chiquitos, Bolivia.]

noticed and a little in the intensity of fine blackish maculations on the dorsum, a few specimens being almost free from the latter while others have a "salt and pepper" effect.

Hyalopteryx asinus n. sp.

Types: ♂ and ♀; São Paulo, São Paulo (♂), Jundiahy, São Paulo (♀), Brazil. September 14, 1900 (♂), February 24, 1899 (♀). (Hempel [♂], Schrottky [♀].) [Acad. Nat. Sci. Phila.]

Allied to *H. rufipennis* Charpentier, but differing in the larger size and slenderer limbs in both sexes, and in the male in the bullate metazona, the broader, more acute tegmina, the elongate internal geniculars processes of the caudal femora and the extremely elongate subgenital plate. The Bolivian *H. exaggerata* Burr is a close ally as

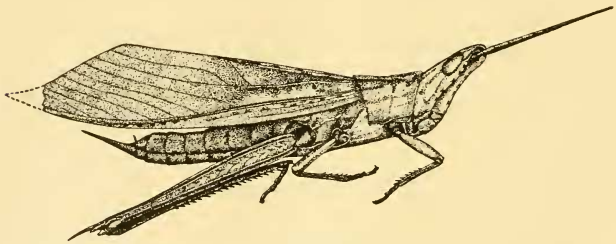


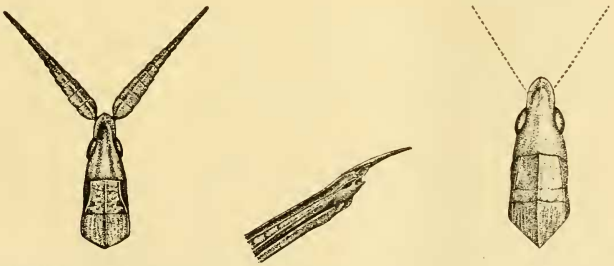
Fig. 1.—*Hyalopteryx asinus* n. sp. Lateral view of male type. (× 2.)

shown by the genicular structures mentioned in the brief original description, but it can be separated by the yellow anal field of the wings and by inference by other characters, as the author says: "In venation and structure, this form resembles *H. rufipennis.*"

Size rather large; form elongate, very distinctly compressed, greatly so in the male; surface rugulose and covered with scattered whitish hairs, both the character of the surface and the hairs being much more pronounced in the male than the female. Head about equal to the pronotum in length in the male, distinctly shorter in the female, the occiput much more ascendent in the male than in the female; fastigium projecting beyond the eyes a distance equal to the width at the cephalic margin of the eyes, lateral margins parallel in the male, slightly converging in the female, the apex with a rounded angle, lateral sections more distinctly depressed and the short medial carina more apparent in the female than in the male; face very strongly retreating in the male, slightly less in the female; frontal costa narrow, moderately

excavated dorsad and mesad, very strongly compressed dorsad, slightly broader and parallel to the ocellus, gently but regularly diverging to the clypeus, the margins in the male all more or less sinuate; antennæ of the male distinctly but not greatly exceeding the head and pronotum in length, strongly ensiform, depressed, greatest width not contained more than seven times in length, the proximal section slender and the apex acute; eyes elongate subovoid, much more acute cephalad in the female than in the male, the infraocular sulcus slightly greater than the length of the eye in both sexes.

Pronotum of the male distinctly, but not very greatly, expanded and sub-bullate on the metazona, of the female with the metazona but very slightly broader than the prozona, the lateral carinæ slightly and regularly expanding caudad; cephalic margin subtruncate, caudal margin obtuse-angulate in the male, obtuse in the female but with the angle more acute and the side margins subemarginate; median carina distinct in both sexes, but apparently more prominent in the female than in the male; lateral carinæ of the male parallel on the cephalic portion of the prozona and following the "shoulder" on the metazona; prozona equal to the length of the metazona in the male,



Hyaloptenyx asinus n. sp. Fig. 2.—Dorsal view of head and pronotum of male type. Fig. 3.—Lateral view of genicular region of caudal femur of male type. Fig. 4.—Dorsal view of head and pronotum of female type. (× 2.)

very slightly shorter in the female; metazona in the male with the dorsal rugæ broken, irregular, and not strictly longitudinal, in the female more regular than in the male but not strongly marked; lateral lobes with the dorsal length very considerably greater than the depth, cephalic and caudal margins converging except for a short parallel ventral section, the ventral margin sinuate-oblique. Tegmina of the male broad, the greatest width about a fourth the distance from the

apex and contained slightly less than four times in the length; costal margin moderately arcuate, apex acute, the sutural margin straight with the apical fourth obtusely deflected to the apex, which considerably exceeds the tip of the subgenital plate. Tegmina of the female lanceolate, exceeding the tips of the caudal femora by about the length of the head, greatest width about a third the distance from the apex, which is acute; greatest width contained about six and a half times in the length; costal margin arcuate distad, the sutural margin straight for about four-fifths the length, the apical fifth obliquely deflected to the apex. Wing of the male very nearly two-thirds the length of the tegmen; costal margin strongly arcuate, the apex rectangulate; hyaline ulnar area with the width contained about two and a half times in the width of the entire wing, complete transverse veins eight in number. Interspace between the mesosternal lobes very distinctly longitudinal in the male, subquadrate in the female; interspace between the metasternal lobes narrow, slightly longitudinal in the male, transverse quadrate in the female. Abdomen more distinctly compressed in the male than in the female; male subgenital plate enormously produced, compressed, the apical section needle-like, the length equal to that of the pronotum.

Cephalic and median limbs slender, femora very slightly arcuate in the male. Caudal femora very slender and elongate, the greatest width in the male being about nine times in the length, about eight and a half in the female, exceeding the tip of the subgenital plate proximal portion hardly inflated, but almost regularly tapering to the apex, carinæ distinct, pattern of the pagina distinct, acute-angulate and but shallowly impressed, genicular lobes in both sexes produced, the dorsal angles of the genicular region produced into broad, somewhat flattened, acute-angulate processes, in the male that of the internal face over twice the length of the external and as long as the femoral depth, in the female the processes of the two sides subequal; caudal tibiæ slender, very slightly shorter than the femur, lateral margins with seventeen to eighteen spines in the male, nineteen in the female; tarsi with rather small arolia.

General color dorsad russet sprinkled and washed with mummy brown, ventral color pale cinnamon. Head in the male with the carinæ spotted with mummy brown and two rather faint postocular lines of the same color present; eyes in the male mars brown, in the female vandyke brown. Pronotum with a pair of irregular dark bars on the lateral carinæ. Tegmina in the male liberally sprinkled with small mummy brown and bistre maculations. Wings with the costal margin

of the hyaline ulnar area and the cross veins of the same canary yellow, the costal section of the wing wood brown clouded with vandyke brown; anal field proximad rather pale scarlet, distal section smoky hyaline, between the two a very distinct and moderately broad bar of hazel. Caudal limbs of the general color of the ventral surface.

Measurements.

	♂	♀
Length of body,	31.2 mm.	37.5 mm.
Length of pronotum,	5.5 "	7.5 "
Length of tegmen,	27 "	34.5 "
Greatest width of tegmen,	7 "	5.1 "
Length of caudal femur,	18.3 "	22 "

A paratypic series of three males has been examined in addition to the type. One is from Jundiahy (Schrottky), and the others from São Paulo (September 14, 1900; Hempel). These specimens do not differ appreciably except very slightly in color and in the slightly greater size of the Jundiahy male.

EUTRYXALIS Bruner.

1900. *Eutryxalis* Bruner, Acc. Gen. and Spec. Locusts Argent., pp. 22, 24.

Included *Metaleptea minor* Bruner (not of Giglio-Tos) and *Eutryxalis strigata* Bruner, of which the former (=*Hyalopteryx gracilis* Giglio-Tos) is the type.

This genus is closely related to *Hyalopteryx*, but differs in the characters given under that genus.

Eutryxalis gracilis (Giglio-Tos).

1897. *H*[*yalopteryx*] *gracilis* Giglio-Tos, Bollett. Mus. Zool. ed Anat. Comp. Torino, XII, No. 302, p. 22. [San Lorenzo, Jujuy, Argentina; Caiza, Bolivian Chaco.]

1900. *Eu*[*tryxalis*] *minor* Bruner, Acc. Genera and Spec. Locusts Argent. p. 24. (Not *Metaleptea minor* Giglio-Tos.) [Argentina; common throughout the provinces north of the Rio Colorado.]

Sapucay, Paraguay. February 10–15, March 2–10, 1905. Seven ♂♂, ten ♀♀. [Foster, Hebard Coll.]

These specimens are quite uniform in size, and in color have the browns and greens distributed in the bicolored individuals as seen in *Truxalis*. No uniform brown specimen has been examined.

The possession of two males and three females of this species from Carcaraña, Argentina, received from Prof. Bruner and labelled *Eutryxalis minor* Giglio-Tos, enabled the author to clear up a rather unfortunate and complicated question of misidentification. A male and female

specimen of *Metaleptea minor* Giglio-Tos, received through Dr. Borelli (the collector of the types) from the Turin Museum, show that the species really is an *Orphula* and not closely related to *Truxalis* (*Metaleptea* Bruner), while the specimens determined by Bruner really are *Hyalopteryx gracilis*, answering the description very well. The species is quite distinct from *Hyalopteryx* and well worthy of generic separation.

From the known records this species appears to be distributed over a large area, extending from Caiza in the Bolivian Chaco to the Rio Colorado, and east to the Paraguay river region.

TRUXALIS Fabricius.

Truxalis brevicornis (Johansson).

Bartica, British Guiana. May 25, 1901. ♂ ♀. (Crew, A. N. S. P.) São Paulo, Brazil. September 7 and 14, 1900. 4 ♂♂, 2 ♀♀. (Hempel, A. N. S. P.) Jundiahy, Brazil. ♀. (Schrottky, A. N. S. P.) Corumbá, Brazil (lowland). March. 5 ♂♂. (H. H. Smith, U. S. N. M.) Sapucay, Paraguay. February 10–17, March 2–21, 1905. 10 ♂♂, 17 ♀♀. (Foster, Hebard Coll.)

This series presents examples of all the color phases noticed in this widely distributed species.

Records for this species include Buenos Ayres and San Lorenzo, Argentina, Villa Rica and Asuncion, Paraguay, and Caiza, Bolivia, as well as numerous localities north of Brazil. Bruner says it is "found throughout the Republic [Argentine] north of the Rio Colorado, especially along the eastern border."[2]

ORPHULA Stål.

1873. *Orphula* Stål, Recensio Orthopterorum, I, p. 105.

Included *pagana* (Stål), *plebeia* (Stål), *intricata* Stål and *punctata* (De Geer), of which *pagana* has been selected as the type by Giglio-Tos.[3]

Orphula pagana (Stål).

1860. *Gomphocerus* (*Hyalopteryx*) *paganus* Stål, Kongliga Svenska Fregatt. Eugenies Resa, Zool., I, Ins., p. 339. [Rio Janeiro, Brazil.]

São Paulo, Brazil. September 1 and 5, 1900. 2 ♀♀. (Hempel, A. N. S. P.) Chapada, Brazil. April. 2 ♂, 1 ♀. (H. H. Smith, U. S. N. M.) Corumbá, Brazil (lowland and highland). March. 2 ♀♀. (H. H. Smith, U. S. N. M.) Sapucay, Paraguay. February 6–13,

[2] *Acc. Gener. and Spec. Locusts Argent.*, p. 23, 1900.
[3] *Bollett. Mus. Zool. Anat. Comp. Torino*, IX, No. 184, p. 9.

March 6–19, 1905. 7 ♂♂, 10 ♀♀. (Foster, Hebard Coll.) Asuncion, Paraguay. 2 ♂♂, 2 ♀♀. (A. N. S. P.)

The specimens from Corumbá are slightly larger than individuals of the same sex from the other localities. Considerable variation also exists in the form of the fastigium, the ♀ from Chapada having it rather broad, but otherwise inseparable, while one individual from Sapucay has the same portion more acute than usual, in a considerable measure approaching *O. minor*. The tips of the tegmina are sharper and more acute in individuals from Chapada, Corumbá and São Paulo than in Asuncion specimens, but the series from Sapucay includes practically both extremes. Some specimens have the dorsal dark lines absent and the coloration but little varied.

The species has previously been recorded from Santos, Brazil, Formosa and Resistencia nel Chaco, Argentina.

Orphula minor (Giglio-Tos).[4]

1897. *M[etaleptea] minor* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, XII, No. 302, p. 23. [San Lorenzo, Jujuy, Argentina; Caiza and Aguairenda, Bolivian Chaco.]

Caiza, Bolivia. (Borelli, A. N. S. P.) One ♂.

Chaco. (Borelli, A. N. S. P.) One ♀.

These authentic specimens, received from the Turin Museum, show that the species is a member of the genus *Orphula* and closely related to *O. pagana*. From the latter species it differs in the slenderer head, with less prominent and somewhat longer eyes, and the more acute fastigium.

MERMIRIÆ.

SYRBULA Stål.

The genus *Syrbula* presents two extreme types, one represented by *admirabilis*, and the other by *montezuma* and *eslavæ*. These extremes might with justice be separated, as has provisionally been done by the author (*i.e.*, subgenus *Herus*), but for the presence of a type like *S. acuticornis*, which is clearly an annectant form.

Syrbula montezuma (Saussure).

The specimens from Cuernavaca, Mexico, previously recorded by the author as *S. valida* and *eslavæ*, and from La Joya, San Luis Potosi, Mexico, are referable to this species, which is closely related to *S. eslavæ* and differs chiefly in the less constricted lateral carinæ of the pronotum.

[4] Bolivar's *Orphula jucunda* (*Actas Soc. Españ. Hist Nat.*, XXV, p. 15) from the Rio Atalapo is probably a member of this genus, but apparently quite distinct from either *O. pagana*, with which it was originally compared, or *O. minor*.

Syrbula eslavæ Rehn.

1900. *Syrbula eslavæ* Rehn, Trans. Amer. Ent. Soc., XXVII, p. 90. [Eslava, D. F., Mexico.]
1900. *Syrbula (Herus) valida* Rehn, Ibid, p. 91. [Eslava, D. F., Mexico.]

These two names were applied to the sexes of the same species.

AMBLYTROPIDIÆ.

AMBLYTROPIDIA Stål.

Amblytropidia ferruginosa Stål.

1873. *A[mblytropidia] ferruginosa* Stål, Recensio Orthopterorum, I, p. 107. [Brazil.]

Sapucay, Paraguay. December 19 and 20, 1901. April 30, 1902. February 13–27, March 2–11, 1905. 9 ♂♂, 12 ♀♀. (Foster, Hebard Coll.)

These specimens are assigned here with some little doubt, as they are larger than Stål's measurement of the female type (length 25 millimeters).

The females all show more or less blackish-brown maculations on the tegmina, and the males have the caudal femora strongly rose-colored with the genicular regions blackish. In the latter respect they appear to approach the very brief characterization of *australis*, but the antennæ are longer and the general coloration rather different. The latter character is of very uncertain value in this genus, as the extremes of one species are quite different, considering *A. occidentalis* a representative form.

Amblytropidia australis Bruner.

1904. [*Amblytropidia*] *australis* Bruner, Biol. Cent.-Amer., Orth., II, pp. 62, 64. [Argentina.]

Chapada, Brazil. April and June. 2 ♂♂, 1 ♀. (H. H. Smith, U. S. N. M.)

As the original description of this species is extremely brief, little can be gleaned from it to aid in identifying material. In the material examined the tegmen are darker near the costal margin than elsewhere, and a median dark line is present on the head and pronotum of the female and the pronotum of one male. The genicular regions are obscured with dark color in both sexes, but more strongly in the male than in the female.

The range of the species is here extended north of its previous limit, Caiza, Bolivian Chaco.

Amblytropidia vittata Giglio-Tos.

1894. *A[mblytropidia] vittata* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, IX, No. 184, p. 13. [Luque, Paraguay.]

São Paulo, São Paulo, Brazil. September 1 and 7, 1900. 2 ♀♀. (Hempel, A. N. S. P.)

The coloration of these two specimens is generally similar, but one has a longitudinal pale green bar on the proximal portion of each tegmen. This specimen also has a median line on the head and pronotum quite dark, while the other individual is devoid of any striking markings.

Amblytropidia trinitatis Bruner.

1904. *Amblytropidia trinitatis* Bruner, Biol. Cent-Amer., Orth., II, pp. 63, 65. [Demerara, British Guiana; Trinidad.]

Trinidad, West Indies. 1 ♂. (H. D. Chipman, through Bruner, A. N. S. P.) Venezuela. 1 ♂. A. N. S. P.

The Venezuela male is inseparable from the topotypic specimen. The range of the species is considerably extended by the Venezuela record.

Amblytropidia auriventris McNeill.

1897. [*Amblytropidia*] *auriventris* McNeill, Proc. Davenport Acad. Nat. Sci., VI, p. 227. [Orizaba, Mexico.]

Atoyac, Vera Cruz, Mexico. December. 1 ♂. (Bruner, A. N. S. P.)

Amblytropidia mysteca (Saussure).

The material previously recorded by the author as *A. mysteca* from Cuernavaca, Texolo, Uruapan and Patzcuaro, Mexico, has been re-examined, and in all cases represents *mysteca* as understood by Bruner.

The genus *Sinipta* Stål is a rather aberrant member of this group, chiefly differing in the depressed, subensiform antennæ, which, however, does not appear to be sufficient to remove it from association with *Amblytropidia*, some species of which have the antennæ somewhat depressed.

ORPHULELLÆ.

The genera generally accredited to this group are with two exceptions, *Calephorus* and *Comacris*, American. The genera examined by the author in this connection are given below, with their apparent positions as far as can be expressed in a linear arrangement.

Calephorus Fieber (=*Oxycoryphus* Fisher).
Parorphula Bruner.
Sisantum Bruner.
Orphulina Giglio-Tos.
Orphulella Giglio-Tos.
Clinocephalus Morse.
Dichromorpha Morse.
Chloealtis Harris.
Cocytotettix n. n. (=*Fenestra* Bruner, not of Giglio-Tos).
Toxopterus Bolivar.

Of these ten genera a total of thirty-six species has been examined.

Several genera like *Chloealtis* and *Toxopterus* are rather aberrant and really occupy isolated positions, that of *Chloealtis*, however, being somewhat modified by *Cocytotettix*, which is in a way a transition type. The European *Calephorus* is also somewhat removed from the nearest ally *Parorphula*, but its position appears to be in this group and its affinity is clearly with the above-mentioned genus. The relationship of *Sisantum* and *Orphulina* is close, as an examination of the type species of each shows, but, for the present at least, I have considered them distinct. The only American genus not examined is *Œonomus* Scudder, from California.

CALEPHORUS Fieber.

1853. *Calephorus* Fieber, Lotos, III, p. 97. May, 1853. Included *C. elegans* Fieber and *Gryllus dubius* Rambur, both equalling *Acrydium compressicornis* Latreille.

1854. *Oxycoryphus* Fischer, Orthoptera Europæa, p. 311. Type, *Acrydium compressicornis* Latreille.

This genus is mentioned merely to show its relationship to *Parorphula* from which it appears to be an offshoot. Aside from the presence of a distinct intercalary vein no character of great weight is apparent to distinguish *Calephorus* from *Parorphula*. Three females of *C. compressicornis* from France and Egypt have been examined.

PARORPHULA Bruner.

1900. *Parorphula* Bruner, Acc. Gen. Spec. Locusts Argent., pp. 22, 25.

Included *P. graminea, pallidinota* and *strigata* Bruner, of which the first, *graminea*, can be selected as the type.

This genus appears to form a transition type between *Calephorus* and the *Sisantum-Orphulina* group.

Parorphula graminea Bruner.

1900. *P[arorphula] graminea* Bruner, Acc. Gen. Spec. Locusts Argent., p. 26. [Provinces of Buenos Aires, Santa Fe and Cordoba, Argentina.]

Carcaraña, Santa Fé, Argentina. 3 ♂♂, 3 ♀♀. (Through Lawrence Bruner, A. N. S. Phila., and U. S. N. M.)

SISANTUM Bruner.

1904. *Sisantum* Bruner, Biol. Cent.-Amer., Orth., II, pp. 30, 69.

Type.—*S. notochloris* Bruner.

Sisantum notochloris Bruner.

1904. *Sisantum notochloris* Bruner, Biol. Cent.-Amer., Orth., II, p. 69. [Medellin, Vera Cruz, Mexico.]

Medellin, Vera Cruz, Mexico. 1 ♂. (T. Heyde through L. Bruner, A. N. S. P.)

The genus *Sisantum* is closely related to *Orphulina*, and the two form a group intermediate between the *Calephorus-Parorphula* type and *Orphulella*.

ORPHULINA Giglio-Tos.

1894. *Orphulina* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, IX, No. 184, pp. 8, 9.

Type.—*O. pulchella* Giglio-Tos.

This genus can be recognized without difficulty by the characters given by Giglio-Tos. The structure of the frontal costa is quite distinctive, at least in several species.

Orphulina pulchella Giglio-Tos.

1894. *O[rphulina] pulchella* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, IX, No. 184, p. 10. [San Pedro, Paraguay.]

Sapucay, Paraguay. March 7–11, 1905. 4 ♀♀. (Foster, Hebard Coll.)

Two of these specimens have the dorsum green or tinted with greenish, the other two being dull ochre in the same region.

Orphulina balloui (Rehn).

1905. *Orphulella balloui* Rehn, Ent. News, XVI, p. 178, pl. VIII, figs. 2 and 3. [Bay Estate, Barbados, West Indies.]

This species is really a member of the genus *Orphulina* and rather closely related to *O. pulchella*. It can be separated by the blunter fastigium, which has both the dorsal and lateral aspects showing a more rounded angle, the slightly more elongate ovoid eye, the slightly less longitudinal and more quadrate interspace between the mesosternal lobes, and the different coloration. The National Museum Collection contains a single female, labelled "West Indies," collected by the U. S. Fish Commission.

Orphulina veteratoria n. sp.

Types: ♂ and ♀; São Paulo, São Paulo, Brazil. September 5 (♀) and 19, 1900. (Hempel; No. 216 part.) A. N. S. P.

Allied to both *pulchella* and *balloui*, but separated from the former by the more robust form, the less compressed eyes, the slightly less pronounced expansion of the lateral carinæ on the metazona and the slightly more acute fastigium. The male has the interspaces between the sternal lobes much as in *Orphulella*. From *O. balloui* it can be separated by the smaller size, more acute fastigium, the more prominent eyes and the heavier caudal femora. This species is not closely related to *O. acuta*.

Size small; form moderately robust. Head slightly shorter than the

pronotum, slightly but distinctly ascending; fastigium about as long as the width at the cephalic angle of the eye (♂) or very considerably

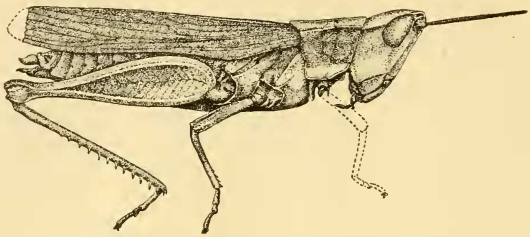


Fig. 5.—*Orphulina veteratoria* n. sp. Lateral view of female type. (× 3.)

shorter (♀), acute-angulate in the male, rectangulate in the female, an intermarginal depressed lunate area in both sexes; lateral foveolæ distinct in the female, much less distinct in the male, cephalic, elongate-lanceolate; face moderately retreating with the apex rather truncate; frontal costa rather narrow, subparallel to below the ocellus, very slightly expanded between the antennæ, the margins moderately divergent ventrad, moderately sulcate from the antennæ ventrad; eyes subovate in the male, ovoid in the female, quite prominent in the male, very slightly longer than the infraocular space in both sexes; antennæ slightly longer than (♂) or subequal to (♀) the head and pronotum together, moderately depressed, slightly expanded proximad and very faintly subensiform. Pronotum with the caudal width contained about once and a half in the length; cephalic margin arcuato-truncate, caudal margin rounded obtuse-angulate; median carina distinct, lateral carinæ slightly narrowed at the second sulcus and moderately divergent caudad in the male, subparallel to the second sulcus and very slightly divergent caudad in the female; first transverse sulcus not intersecting any of the carina, second intersecting the lateral, and the third intersecting the lateral and median carinæ, metazona slightly longer than the prozona in the male, subequal in the female; lateral lobes very distinctly longer than the depth, ventral margin with a considerable oblique cephalic emargination. Interspace between the mesosternal lobes slightly transverse in the male, and slightly longitudinal in the

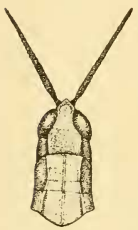


Fig. 6.—*Orphulina veteratoria* n. sp. Dorsal view of head and pronotum of female type. (× 3.)

female; metasternal lobes separated by a very narrow space in both sexes. Tegmina slightly exceeding the tips of the caudal femora, the caudal margin with a distinct but rather small proximal dilation, apex rotundato-truncate; intercalary vein distinct in the female, irregular in the male. Abdomen moderately compressed; subgenital plate of male blunt. Caudal femora moderately robust, considerably dilated in the proximal two-thirds, pagina rather deeply sculptured; caudal tibiæ somewhat shorter than the femora, lateral margins bearing ten or eleven spines, arolia small, subtrigonal.

General color of the male bistre, the anal area of the tegmina and the dorsum of the pronotum burnt umber, the lateral angles of the pronotum ventrad and slightly mesad on the pronotum marked with black; eyes walnut brown; ventral surface buffy becoming buff-yellow on the abdomen; caudal femora ochre yellow becoming tawny, ochraceous and raw umber distad, caudal tibiæ dull heliotrope purple, the spines yellowish narrowly tipped with black.

General color of female bistre becoming wood brown ventrad; dorsum of the head, pronotum and anal area of the tegmina pale apple green, the lateral carinæ of the pronotum marked with blackish as in the male but more narrowly; eyes raw umber blotched with bistre.

Measurements.

	♂	♀
Length of body,	14 mm.	19 mm.
Length of pronotum,	3 "	4 "
Length of tegmen,	12 "	15 "
Length of caudal femur,	10 "	11.2 "

The types are the only specimens of this species which have been examined. It is possible that the sexes here described do not represent the same species, and that my association of them is erroneous. Several characters of the ♂ do not appear to be in accord with one's ideas as to what the opposite sex of the ♀ type should be, but as neither belongs to an old species of the genus I have thought best to associate them, pending the acquisition of further material. In case the sexes should prove to represent distinct species I would restrict the name *veteratoria* to the ♀.

Orphulina acuta n. sp.

Types: ♂ and ♀; São Paulo, São Paulo, Brazil. (Hempel; No. 216 part.) A. N. S. P.

Allied to *O. pulchella*, but a heavier species with the fastigium more acute, the eyes longer, and more compressed when viewed dorsad, the

tegmina and caudal femora shorter, the latter more robust, and the whole insect lacking the prominent lateral stripe of *O. pulchella*.

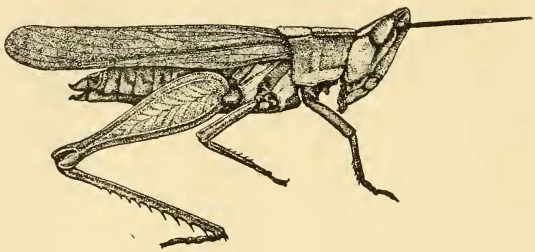


Fig. 7.—*Orphulina acuta* n. sp. Lateral view of female type. (× 3.)

Size small; form somewhat robust, moderately compressed. Head distinctly shorter than the pronotum, considerably elevated in both sexes, the occiput more rounded in the male than in the female, the latter having it almost straight; fastigium acute-angulate in both sexes, but slightly more so in the male than in the female, the width at the cephalic angle of the eye equal to (♂) or slightly greater (♀) than the length, margins distinct, a moderately depressed intermarginal area present on the dorsum, no median carina; lateral foveolæ distinct, deep, cephalic, blunt elongate-lanceolate in shape; the front dorsad forming a right angle with the fastigium, ventrad of the antennæ considerably retreating; frontal costa narrow in the male regularly but slightly expanding from the fastigium to the clypeus, deeply sulcate, particularly dorsad of the ocellus; frontal costa in the female similar to the male but subparallel from between the antennæ to the ocellus, the width being greater and the sulcation shallower than in the male; eyes regularly ovoid in the male, acute ovoid flattened cephalad in the female, in both sexes very distinctly exceeding the infraocular sulcus in the length; antennæ slightly longer (♂) or slightly shorter (♀) than the length of the head and pronotum, slightly depressed and expanded proximad, being thus very slightly ensiform. Pronotum with the greatest caudal width of the dorsum contained once and a half in the length; median carina very distinct, severed in the middle, lateral carinæ

Fig. 8.—*Orphulina acuta* n. sp. Dorsal view of head and pronotum of female type. (× 3.)

parallel to the second sulcus, considerably expanding between the second and third, very slightly expanding to the caudal margin; cephalic margin subtruncate, caudal margin obtuse-angulate, more rounded in the male than in the female; first transverse sulcus obsolete; lateral lobes of the pronotum with the dorsal length slightly greater than the depth, ventral margin with a considerable cephalic emargination. Interspace between the mesosternal lobes moderately longitudinal in the male, slightly so in the female; metasternal lobes contiguous caudad in the male, separated by a space about a fourth the width of the mesosternal interspace in the female. Tegmina considerably exceeding the tips of the caudal femora in length, apex rounded, costal margin with a very narrow and slight proximal lobe; hyaline in the proximal third; intercalary vein irregular and extending the whole length of the area, becoming lost in irregular reticulations; ulnar area with a distinct longitudinal dividing vein in both sexes. Wings ample. Abdomen considerably compressed; subgenital plate compressed with a blunt apical tubercle. Caudal femora robust, the pagina deeply and strongly sculptured; caudal tibiæ distinctly, but not greatly, shorter than the femora, the lateral margins armed with ten or eleven spines; tarsi with large arolia.

General color shading from tawny-olive to burnt umber. Head and pronotum with postocular bars of vandyke brown, broad and dark in the male, quite narrow and light in the female. Dorsum of the head, pronotum and closed tegmina lighter than the lateral aspects, tawny-olive in the female, bay in the male. Venter wood brown. Limbs varying shades of the general color; tarsi very pale viridian green, with the base of the first, the whole second, the apex of the third, arolium and tips of the claws black; spines on the tibiæ tipped with black.

Measurements.

	♂	♀
Length of body,	14 mm.	18.5 mm.
Length of pronotum,	3 "	4 "
Length of tegmen,	12.5 "	16.2 "
Length of caudal femur,	8.5 "	10.7 "

A paratypic series of two females have also been examined (September 7 and 14, 1900), and differ in no important characters from the type. One specimen represents a darker and more sooty type of coloration than the other.

ORPHULELLA Giglio-Tos.

1894. *Orphulella* Giglio-Tos, Bollett. Musei Zoolog. Anat. Comp. Torino, IX, No. 184, pp. 8, 10.

Included *O. gracilis* Giglio-Tos, *punctata* (De Geer), *intricata* Stål

and *elegans* Giglio-Tos. Of these *punctata* is the oldest known and the most widely distributed species, and may be considered the type.

The species of this genus are quite difficult to separate and the recognition of almost all the forms can be considered only tentative. The extent of individual variation is great, both in structure and color, and reliable characters for the separation of species are few. The work of Bruner in the *Biologia* is by far the best treatment of the genus so far published.

Orphulella neglecta Rehn.

1900. *Orphulella neglecta* Rehn, Trans. Amer. Entom. Soc., XXVII, p. 94. [Orizaba, Vera Cruz, Mexico.]

Orizaba, Mexico. June. 1 ♂; type. (O. W. Barrett, A. N. S. P.) 2 ♂♂. (Sumichrast, A. N. S. P. received through Dr. Saussure.) Jalapa, Mexico. August and September. 2 ♂♂. (Barrett, A. N. S. P.) Presidio, Mexico. June. 1 ♂. (Barrett, A. N. S. P.) Coatepec, Mexico. August. 1 ♂, 1 ♀. (Barrett, A. N. S. P.)

This series shows that the species varies somewhat in size (males from 16 to 21 millimeters in total length), but little in color. All except one ♂ from Jalapa are of the same colors, allowance being made, of course, for fading in the Sumichrast specimens, while the Jalapa exception has the usual green dorsum replaced by a dull olive tint, while the pronotum near the lateral lobes is not as distinctly marked as in the other specimens.

The ♀ specimen measures as follows: length of body, 22 mm.; length of pronotum, 4.1; length of tegmen, 17; length of caudal femur, 12.9.

This species seems to be a form limited to the Eastern Cordilleras.

Orphulella aculeata Rehn.

1900. *Orphulella aculeata* Rehn, Trans. Amer. Entom. Soc., XXVII, p. 92. [Cuernavaca, Morelos, Mexico.]

Cuernavaca, Mexico. June. 1 ♂, 3 ♀♀ including types. (O. W. Barrett, A. N. S. P.)

This species appears to be quite distinct, and is not an *Orphulina* as has been thought possible by Bruner.[5] Superficially this form considerably resembles *O. viridescens* Scudder, but the structural characters are quite distinctive and show that no close relationship exists.

Orphulella gracilis Giglio-Tos.

1894. *Orphulella gracilis* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, IX, No. 184, p. 11. [Province of San Pedro, Villa Rica and Asuncion, Paraguay.]

Sapucay, Paraguay. December 20, 1901 (one specimen). 2 ♂♂. (Foster, Hebard Coll.)

[5] *Biol. Cent.-Amer.*, Orth., II, p. 74, 1904.

The validity of this species appears to be somewhat doubtful, Giglio-Tos himself [6] considering it a synonym of the North American *O. maculipennis* (=*pelidna* Burmeister). In this he is of course in error, but it is extremely close to *O. punctata*, which is so variable that *gracilis* may only be an extreme with the lateral carinæ more or less obliterated between the first and third transverse sulci. The form is rather more elongate, however, than in the average individual of *O. punctata*.

Orphulella punctata (De Geer).

San Rafael, Vera Cruz, Mexico. ♂, ♀. (Townsend through L. Bruner, A. N. S. P.) San Marcos, Nicaragua. 2 ♀♀. (C. F. Baker, A. N. S. P.) Trinidad. ♂, ♀. A. N. S. P. Bartica, British Guiana. May 1–27, 1901. 23 ♂♂, 14 ♀♀. (Crew, A. N. S. P.) São Paulo, Brazil. September 1–19, 1900. 5 ♂♂, 5 ♀♀. (Hempel, A. N. S. P.) Sapucay, Paraguay. February 3–27, March 6–12, 1905. 10 ♂♂, 22 ♀♀. (Foster, Hebard Coll.)

This large series of specimens, representing a very considerable range, I find cannot be divided into species on any one or number of the innumerable characters of variation exhibited. The green and brown phases of coloration, varied with maculations and distinct bars or uniform with practically no markings, and variations in the shape and strength of the lateral carinæ of the pronotum, in the length of the tegmina and wings, in the form of the fastigium and eyes, some slight, others pronounced, are all present, and on superficial examination would appear to furnish good characters for dividing the series. Attempts along these lines, however, soon show how hopeless it would be to erect species on even the most striking types, as intermediates are present to connect them with any other extreme.

Two specimens from Gualaquiza and Valle del Lamora, Equador, received from the Turin Museum, labelled "*Orphula olivacea*" and recorded as such by Giglio-Tos,[7] are provisionally referred to this species. They are clearly not *O. olivacea*, as comparison with paratypic material shows, and having been preserved in alcohol are badly shrivelled in consequence.[8]

Orphulella elegans Giglio-Tos.

1894. *O[rphulella] elegans* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, IX, No. 184, p. 12. [Resistencia nel Chaco, Argentina; Province of San Pedro, Villa Rica and Asuncion, Paraguay.]

---

[6] *Bollett. Mus. Zool. Anat. Comp. Torino*, XII, No. 302, p. 24, 1897.
[7] *Bollett. Mus. Zool. Anat. Comp. Torino*, XIII, No. 311, p. 39, 1898.
[8] Bolivar's *Orphula patruelis* (*Actas Soc. Españ. Hist. Nat.*, XXV, p. 15) from the Rio Atalapo I have not recognized, and can give no idea of its proper position.

Four specimens, two of each sex, from Carcaraña, Argentina, determined as this species by Bruner, I am unable to separate from my series of *punctata*, which includes material determined as that species by Bruner. Individuals of the latter from Nicaragua, Costa Rica and British Guiana resemble the Carcaraña specimens very closely.

Orphulella intricata (Stål).

1873. *T[ruxalis] intricata* Stål, Recensio Orthopterorum, I, p. 106. [Buenos Ayres.]

Two specimens, ♂ and ♀, one from Cordoba, the other from Carcaraña, Argentina, determined as this species by Bruner, are available for study. I am of the opinion that this species will prove to be merely a phase of the very variable *O. punctata*.

Orphulella mexicana (Saussure).

1861. *Ox[ycoryphus] mexicanus* Saussure, Revue et Magasin de Zoologie, 2e sér., XIII, p. 314. [Mexico.]

Jalapa, Vera Cruz, Mexico. August. 2 ♀♀. (O. W. Barrett, A. N. S. P.) Coatepec, Mexico. August. 1 ♀. (Barrett, A. N. S. P.) Texolo, Mexico. March 13, 1899. 5 ♂♂. (S. N. Rhoads, A. N. S. P.)

The above records, with the Jalapa record given by Bruner in the *Biologia*,[9] constitute the sum of our knowledge of this species. It appears to be restricted in its range, as suggested by Bruner, and the taking of five specimens in one day shows it can hardly be called rare. The species is apparently confined to the country on the lower eastern slope of the Cofre de Perote. The compressed form of this insect will readily separate it from allied species. The compression of the male abdomen with its appendages is quite pronounced.

Orphulella tepaneca (Saussure).

1861. *St[enoboth]r[us] tepanecus* Saussure, Revue et Magasin de Zoologie, 2e sér., XIII, p. 319. [Mexico.]

Orizaba, Vera Cruz, Mexico. July 14, 1891. 1 ♂, 1 ♀. (W. S. Blatchley, A. N. S. P.)

This pair was received from Blatchley labelled "*Orphulella zapoteca*," but they are clearly not that species and answer Saussure's description of *tepanecus* very well. This species would appear to be limited in range to the vicinity of Orizaba, Bruner having also recorded it from there.

Orphulella meridionalis Bruner.

San Marcos, Nicaragua. 1 ♂. (C. F. Baker, A. N. S. P.) Chinandega, Nicaragua. 1 ♂. (C. F. Baker, A. N. S. P.)

[9] *Biol. Cent.-Amer.*, Orth., II, p. 80, 1904.

These specimens have been compared with the Costa Rican individuals previously recorded by the author.[10]

Orphulella zapoteca (Saussure).

1861. *Ox[ycoryphus] zapoteca* Saussure, Revue et Magasin de Zoologie, 2e sér., XIII, p. 316. [Mexico.]

Texolo, Vera Cruz, Mexico. March 3 and 13, 1899. 8 ♂♂. (S. N. Rhoads, A. N. S. P.)

The specimens from Alta Mira, Tamaulipas, previously recorded by the author as *O. tepancca* are referable to this species. The frontal costa, however, is moderately sulcate in all the Tamaulipas individuals.

Orphulella viridescens Scudder.

1899. *Orphulella viridescens* Scudder, Canad. Entom., XXXI, p. 187. [Mt. Alvarez, Mexico.]

The specimens previously recorded by the author from Eslava, D. F., Mexico,[11] are now before me. This species is quite distinct from any other mainland form, and rather closely related to *O. scudderi.*

DICHROMORPHA Morse.

1896. *Dichromorpha* Morse, Psyche, VII, pp. 326, 383.

Type.—*Chlocaltis viridis* Scudder.

Dichromorpha mexicana Bruner.

1904. *Dichromorpha viridis* Rehn (not of Scudder), Proc. Acad. Nat. Sci. Phila., 1904, p. 518. [Guadalajara, Jalisco, Mexico.]
1904. *Dichromorpha mexicana* Bruner, Biol. Cent.-Amer., Orth., II, p. 87. [Sinaloa and Tepic, Mexico.]

Aside from the longer tegmina and wings this species differs from *viridis* in the slightly more robust form and the more acute fastigium in both sexes.

The range of this species now covers three States or Territories on the west coast of Mexico—Sinaloa, Tepic and Jalisco.

Dichromorpha longipennis Bruner.

1904. *Dichromorpha longipennis* Bruner, Biol. Cent.-Amer., Orth., II, p. 87. [Mexico.]

Guadalajara, Jalisco, Mexico. August 20. 1 ♂. (J. F. McClendon, A. N. S. P.)

This specimen is uniform brown and does not exhibit the green dorsum mentioned by Bruner as present in the type ♂. This the first definite record of the species.

---

[10] *Proc. Acad. Nat. Sci. Phila.*, 1905, p. 802.
[11] *Trans. Amer. Entom. Soc.*, XXVII, p. 95, 1900

COCYTOTETTIX[12] n. n.

1900. *Fenestra* Bruner (not of Giglio-Tos), Acc. Gen. Spec. Locusts Argent., pp. 22, 30.[13]

Included *F. pulchripennis, intermedia* and *argentina* Bruner, of which the first may be considered the type.

This genus is quite distinct from any other, but is nearer to the North American *Chloealtis* than any South American type. The Matto Grosso *C. linearis*[14] is rather aberrant in the slender form, narrow tegmina, weaker carina and more hyaline wings.

Cocytotettix pulchripennis (Bruner).

1900. *F[enestra] pulchripennis* Bruner, Acc. Gen. Spec. Locusts Argent., p. 30. [Argentina; open camp.]

Carcaraña, Santa Fé, Argentina. 2 ♂♂. (Through L. Bruner, A. N. S. P.)

Cocytotettix intermedius (Bruner).

1900. *F[enestra] intermedia* Bruner, Acc. Gen. Spec. Locusts Argent., p. 31. [Carcaraña, Argentina.]

Carcaraña, Santa Fe, Argentina. 2 ♂♂, 1 ♀. (Through L. Bruner, A. N. S. P.)

The ♂ of this species superficially remind one of the males of the certain species of the genus *Syrbula*.

TOXOPTERUS Bolivar.

1890. *Toxopterus* Bolivar, Anales Soc. Españ. Hist. Nat., XIX, p. 313.

Type.—*T. miniatus* Bolivar.

This genus is rather aberrant and isolated in position in consequence, but its position is in the Orphulellæ, and nearer to *Cocytotettix* than any other genus. The structure of the antennæ is similar to that of *Gomphocerus*, but such resemblance is also found in *Eritettix*, which is a member of the Amblytropidiæ, and are superficial and not of great taxonomic value.

Toxopterus miniatus Bolivar.

1890. *Toxopterus miniatus* Bolivar, Anales Soc. Españ. Hist. Nat., XIX, p. 314. [Cumbase, Peru.]

Sapucay, Paraguay. January 18, 1903. January 28, February 6–25, March 2–10, 1905. 7 ♂♂, 13 ♀♀. (Foster, Hebard Coll.)

---

[12] The genus *Fenestra* is invalid from Bruner (*Ann. Mus. Civ. Stor. Nat. Genova*, XXXIII, p. 120, 1893), as he designates no named species for type or included forms. The first species named under the generic term *Fenestra* was *F. bohlsii* Giglio-Tos (*Zool. Jahrb.*, Syst., VIII, p. 807, 1895), which, on a subsequent page (p. 32), I will show to be the species later named *Dichroatettix viridifrons* Bruner, and for which the generic name *Fenestra* must be used.

[13] Κωκυτος, *shrieking*, τεττιξ, *grasshopper*; in allusion to the loud stridulations.

[14] *Proc. U. S. Nat. Mus.*, XXX, p. 374.

This series exhibits considerable variation in the intensity of the coloration, the dorsal aspect ranging in color from dull blackish brown to mottled ochre and umber and again washed with dull green. The paler lateral bands, including the ventral portion of the lateral lobes, pleura and caudal femora are distinct in all the specimens examined and in several are decidedly greenish; in these cases the genæ are also colored. Some individuals are distinctly maculate, or might really be called tessellate, ochre and umber being the two colors. Considerable variation in the sharpness of the angle of the fastigium is also noticeable, and in both sexes. In some females the angle is almost as acute as in some males.

The species has previously been recorded by Giglio-Tos [15] from Gualaquiza, Cuchipamba and the valley of Santiago, Ecuador.

GOMPHOCERI.

The South American genera of this group are six in number, three previously known and three recognized as the result of the present study. Of these genera two will be described in a subsequent paper, but they are mentioned here to show their position in the series. The genera would stand as follows:

Fenestra Giglio-Tos (=*Dichroatettix* Bruner).
Staurorhectus Giglio-Tos.
Isonyx n. gen.
Borellia n. gen.
Stereotettix n. gen.
Tristira Bruner.

The first genus is quite distinct, as is the second. The next three genera, *Isonyx*, *Borellia* and *Stereotettix*, show some characters in common, but differ in a number of others, such as the position of the lateral foveolæ and the relative proportion of the spurs. The last, *Tristira*, is a quite distinct type, much isolated from the others and immediately recognizable by its peculiar facies.

FENESTRA Giglio-Tos.

1895. *Fenestra* Giglio-Tos, Zoolog. Jahrbücher, Syst. Abth., VIII, p. 807.

Type.—*F. bohlsii* Giglio-Tos.

1900. *Dichroatettix* Bruner, Acc. Genera Spec. Locusts Argent., pp. 22, 32.

As I have stated on a previous page (p. 30) these names apply to the same genus and species. As there stated *Fenestra* is invalid from Bruner, 1893,[16] on account of the lack of a type or included named

[15] *Bollett. Mus. Zool. Anat. Comp. Torino*, XIII, No. 311, p. 39.
[16] *Ann. Mus. Civ. Stor. Nat. Genova*, XXXIII, p. 120.

species. The only information we have is a footnote to the extent that "Ce genre est fondé sur une espèce de Buenos Aires." The next use of the name is by Giglio-Tos, who placed the species in hand in that genus, in spite of the sanguineous wings, which appendages were stated to be hyaline by Bruner. Bruner was apparently unacquainted with the paper of Giglio-Tos and erected a new genus *Dichroatettix* for a species, which is undoubtedly the same as *F. bohlsii* Giglio-Tos, while *Fenestra* was applied to three species, which therefore require a new generic name, a want supplied on a previous page of this paper.[17]

This genus is related to the North American genera *Napaia* and *Horesidotes*. It can be distinguished from the former by the less expanded antennæ, the strongly constricted lateral carinæ of the pronotum, the subequal prozona and metazona, the distinctly angulate caudal margin of the pronotum, the longer tegmina with more definite venation and the very peculiar cerci. From *Horesidotes* (which has not been examined) it appears to differ in that the occiput has no distinct median carina, the caudal margin is more angulate and the lateral lobes of the pronotum are deeper than long.

Fenestra bohlsii Giglio-Tos.

1895. *F[enestra] bohlsii* Giglio-Tos, Zoolog. Jahrbücher, Syst. Abth., VIII, p. 807. [Paraguay.]

1900. *Dichroatettix viridifrons* Bruner, Acc. Gen. Spec. Locusts Argent., p. 33, figs. 9 and 10. [Cordoba and Carcarañia, Argentina.]

Cordoba, Argentina. 1 ♂. (Through L. Bruner, U. S. N. M.) Sapucay, Paraguay. January 24, 26, February 13 and March 2–21, 1905. 5 ♂♂, 10 ♀♀. (Foster, Hebard Coll.)

This series shows that the green color of the face is not present in some of the females, and in such as it is present the lateral lobes of the pronotum are always, and generally also the dorsum, the pleura and the caudal femora, except the apices, of the same color. All the males examined have the face green. In some specimens the dorsum of the pronotum is without the velvety black patches seen in others, in fact about half the specimens are without them. Size, as exhibited

[17] The name *Dichroatettix* might with justice be used for this genus if the unidentifiability of the Brunnerian genus *Fenestra* precludes its use by Giglio-Tos. As an unidentifiable name requires different treatment from a *nomen nudum* the use of *Fenestra* once in such a way would by some be considered to preclude its subsequent use, its existence terminating as a name when considered unidentifiable. A *nomen nudum*, being considered to express nothing definite, can be properly used by a later author from whom it dates. An unidentifiable name, on the other hand, represents something imperfectly and improperly presented and should be discarded for all time. I have presented both views, the proper presentation of the name by a later author and the complete elimination of the name, and leave others to choose for themselves. In any case Giglio-Tos's species *bohlsii* would stand.

by this series, is subject to little variation. Some of the females show considerable variation in the angle of the fastigium.

STAURORHECTUS Giglio-Tos.[18]

1897. *Staurorhectus* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, XII, No. 302, p. 25.

Type.—*S. longicornis* Giglio-Tos.

This genus is apparently closer related to *Chorthippus* (*Stenobothrus*) than to any other genus of the group, the tegmina of the male being rather similar in some species, but the lateral foveolæ are very weak, the lateral carinæ of the pronotum are much less distinct and the caudal femora slenderer.

Staurorhectus longicornis Giglio-Tos.

1897. *S*[*taurorhectus*] *longicornis* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, XII, No. 302, p. 26. [San Lorenzo and Tala, Argentina; Caiza, Bolivia.]

Campo Santo, Bolivia.[19] 1 ♂. (Borelli, A..N. S. P.) San Lorenzo, Jujuy, Argentina. 1 ♀. (Borelli, A. N. S. P.) Sapucay, Paraguay. March 2–27, 1905. 12 ♂♂, 37 ♀♀. (Foster, Hebard Coll.)

The interesting series listed above exhibits a very great range of variation with four distinct color forms in the ♀; the ♂ is more uniformly colored. These forms I will designate *a*, *b*, *c* and *d*, lettering from the most diversified to the most uniform type.

Type *a*. A median longitudinal line from fastigium to tip of tegmina buff, flanked by lines of blackish brown on pronotum and tegmina, on the latter occupying all except a narrow proximal costal line of pale yellow. Lateral carinæ distinct, light, slightly constricted. Light bar on head slightly margined with brownish. Remainder of lateral aspect, and caudal femora except the dorsal blackish line and the reddish distal section, grass green. Represented by twelve specimens.

Type *b*. Similar to type *a*, but green replaced by ochraceous brown. Represented by eight specimens.

Type *c*. The dorsal median line in this type is almost lost and nearly concolorous with the lateral bars, so that dorsum from the fastigium caudad is nearly uniform. Represented by six specimens.

[18] It is quite possible this may prove to be the same as *Compsacris* Bolivar (*Anales Soc. Españ. Hist. Nat.*, XIX, p. 314, 1890) based on one species—*C. pulcher*—from "Villa Bella en el Perú," which is apparently Villa Bella, Bolivia, at the junction of the Beni and Mamore rivers. If such should prove to be the case *Compsacris* would replace *Staurorhectus*. None of the species examined by the author are closely related to *C. pulcher* judging from the description.

[19] Labelled as above, but Campo Santo, Salta Province, Argentina, is probably intended.

Type *d*. Tegmina colored much as in type *a*, but head, pronotum, pleura and limbs suffused with rose red, the usual markings being only faintly indicated. Represented by eleven specimens.

The largest ♀ specimen (38 millimeters in length of body) belongs to type *c*, the smallest (30 millimeters) to type *a*. The typical ♀ received from the Turin Museum has been immersed in a liquid preservative and it is impossible to tell to which type it belongs.

One ♂ individual has a coloration which would be considered type *c*. while the other males are of a type which approximates closer to the ♀ type *b* with, however, some greenish, but not on the caudal femora.

The curve of the fastigium of the female varies from arcuate to distinctly angulate, and is more excavated in some than in others.

Staurorhectus glaucipes n. sp.

Type: ♀; Sapucay, Paraguay. March 8, 1905. (Foster; No. 32.) Hebard Collection.

Allied to *S. longicornis* Giglio-Tos, but considerably smaller and slenderer with the fastigium more acute, the frontal costa more sulcate, the lateral foveolæ of the vertex practically suppressed, the ulnar

Fig. 9.—*Staurorhectus glaucipes* n. sp. Lateral view of type. (× 2.)

area of the tegmina without a distinct longitudinal dividing vein, no distinct continuous intercalary vein present, and possessing a characteristic coloration which does not appear to vary appreciably in a series of ten females.

Size rather small; form moderately slender. Head distinctly shorter than the pronotum, the occiput not elevated and gently arched longitudinally; fastigium shorter than the width at the cephalic angle of the eyes, slightly acute, the apex rounded, margins with a narrow semicircular depression, no median carina present; lateral foveolæ not distinct, ventrad; face considerably retreating, the apex acute when viewed laterad; frontal costa moderately wide, margins subparallel, reaching to the clypeus, sulcate from dorsad of the antennæ ventrad; eyes elongate-ovoid, very slightly longer than the infraocular sulcus; antennæ considerably exceeding the head and pronotum together in

length, nearly two-thirds the length of the tegmen, moderately depressed proximad and very slightly dilated. Pronotum moderately rounded but with a perceptible dorsal flattening; cephalic margin slightly arcuate, caudal margin broadly obtuse-angulate with the angle rounded, no lateral carinæ present, but a moderate shoulder developed on the metazona; greatest caudal width contained about one and two-thirds in the length, metazona regularly and closely, but not deeply, punctate; three distinct transverse sulci present on the dorsum, the caudal only intersecting the median carina, which is distinct and regular; lateral lobes with the dorsal length very considerably greater than the depth, ventral margin sinuato-angulate. Interspace between the mesosternal lobes slightly longitudinal; interspace between the metasternal lobes hardly narrower than between the mesosternal lobes, pentagonal. Tegmina very slightly exceeding the apex of the abdomen, but falling considerably short of the caudal femora; marginal field with a very slight proximal dilation, apex rather narrowly rounded, no intercalary vein present. Wings ample. Abdomen considerably compressed. Caudal femora considerably inflated proximad, the distal section quite slender, pattern of the pagina very distinct, regular; caudal tibiæ very slightly shorter than the femora, gently sinuate, the external margins with eleven or twelve spines, internal spurs slightly unequal; tarsi with distinct, rounded arolia.

Fig. 10. — *Stauroрhectus glaucipes* n. sp. Dorsal view of head and pronotum of type. (× 3.)

General color apple green, becoming more oil green on the caudal femora. Two broad lines, one on each side, of vandyke brown start from the margins of the fastigium, cross the dorsum of the eyes, extend over the pronotum, and on the tegmina broaden out and occupy the entire discoidal and all except the proximal portion of the marginal fields. On the head the color of these bars is decidedly blackish brown, about true vandyke brown on the pronotum, becoming dilute and fainter as the stripe broadens on the tegmina, while along the ventral margins of these bars the green is touched with yellowish, while the light proximal section of the marginal field is cream color. Antennæ vandyke brown with the proximal joint green; eyes tawny-olive and bistre mottled; caudal femora with the genicular regions laterad and ventrad black, the pagina with a dorsal longitudinal bar of

olive, except for a pregenicular annulus of clear green; caudal tibiæ bice green, the genicular section blackish and the distal portion slightly suffused with brownish, spines and spurs tipped with black.

Measurements.

Length of body,	26	mm.
Length of pronotum,	5	"
Length of tegmen,	19	"
Length of caudal femur,	16.3	"

A paratypic series of nine males have also been examined, the dates being as follows: December 21, 1904; January 26, February 15, March 7, 18 and 21, 1905. This series is rather uniform in size, two females, however, being appreciably smaller than the others. In color one specimen has the green more glaucous, while several others show a tendency in the same direction. One specimen has the caudal femora, the lateral lobes and the face suffused with orange vermilion. The intensity of the longitudinal bars appears to vary very little; on the tegmina, however, some specimens are more strongly colored than others.

ISONYX n. gen.[20]

This genus probably is closer related to *Borellia* Rehn[21] than to *Staurorhectus*, and may possibly be considered a distinct and separate type with no close relationship to either the above mentioned genera. The characters are so contradictory and the facies so different that the author does not feel justified in making detailed comparisons, but prefers to present the rather striking features of the form in the general description. It might be added that this position is assigned to *Isonyx* after studying all the South American Gomphoceri, both genera and species.

Isonyx paraguayensis n. sp.

Types: ♂ and ♀. Sapucay, Paraguay. February 12 (♀) and 27 (♂), 1905. (Foster; Nos. 24 and 165.) Hebard Collection.

Size rather small; form moderately compressed and slender; surface subsericeous. Head slightly (♂) or considerably (♀) shorter than the pronotum, the occiput very slightly elevated and rounded; fastigium subrectangulate in the male, obtuse-angulate in the female, very much shorter than the width at the cephalic angle of the eyes, margins

[20] Ισος, *equal*; ονυχ, *claw*.
[21] *Proceedings of the U. S. National Museum*, XXX p. 379.

distinct with a broad sublunate intermarginal depression, no median carina present, fastigium when viewed laterad moderately declivent;

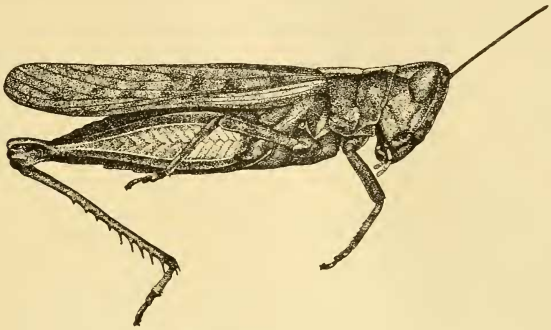


Fig 11.—*Isonyx paraguayensis* n. gen. and sp. Lateral view of female type. (× 3.)

dorsal section of the face vertical, ventrad of the antennæ considerably (♂) or gently (♀) retreating; lateral foveolæ distinct, cephalic well impressed and excavated, sublanceolate; frontal costa strongly compressed dorsad, regularly expanding ventrad of the antennæ to the clypeus, with an additional rotundate expansion at the ocellus, slightly sulcate ventrad of the ocellus; eyes subovate in the male, subovoid in the female, flattened cephalad in the latter sex, moderately prominent

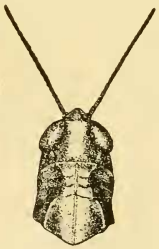


Fig. 12.—*Isonyx paraguayensis* n. gen. and sp. Dosal view of head and pronotum of female type. (× 3.)

Fig. 13.—*Isonyx paraguayensis* n. gen. and sp. Lateral view of abdomen of male type. (× 6.)

in the male when viewed dorsad; antennæ subequal to the head and pronotum in length in the male, slightly shorter in the female. Pronotum deplanate dorsad, the greatest caudal width contained about once and a quarter in the length; cephalic margin subtruncate, caudal

margin obtuse-angulate in both sexes; median carina distinct but not high, severed by the third sulcus slightly cephalad of the middle; lateral carinæ clepsydral, strongly constricted to the first sulcus, absent between the first and second, straight between the second and third, wider spaced caudad of the third sulcus than cephalad of it, arcuate diverging caudad; lateral lobes with the greatest dorsal length slightly less than the greatest depth, the ventral margin sinuato-angulate, a weak shoulder running diagonally ventro-cephalad on the prozona. Interspace between the mesosternal lobes subquadrate in the male, slightly transverse in the female; metasternal lobes contiguous caudad in the male, separated by a small ovate space in the female. Tegmina slightly exceeding the tips of the caudal femora, the tips rounded, costal margin with the proximal lobe small and low; intercalary vein present, distinct but irregular, and becoming lost proximad in the reticulations; ulnar area with a longitudinal dividing vein as distinct as the intercalary in the male, more distinct and regular in the female. Wings ample. Abdomen considerably compressed; cerci of the male styliform, apex rather blunt; subgenital plate of the male somewhat contracted and turned in dorsad, apex moderately acute and but slightly produced. Cephalic and median limbs rather slender, more robust and somewhat inflated in the male. Caudal femora quite robust, considerably inflated, pagina sharply but not very deeply sculptured; caudal tibiæ slightly shorter than the femora and with a hardly perceptible sinuation, lateral margins with ten spines in the male and nine in the female, internal spurs moderately arcuate, equal; tarsi with distinct arolia.

General color vandyke brown, mottled and overlaid with seal brown, clove brown and blackish. Eyes cinnamon (♂) or mummy brown (♀); occiput with two dark arcuate, diverging bars extending caudad from between the eyes. Pronotum with the lateral carinæ, lateral sections of the dorsum of the metazona and the extreme upper portions of the lateral lobes seal brown or blackish, leaving a unicolor median bar extending from the fastigium to the caudal margin of the pronotum, which is more or less hazel in the male and apple green in the female; remaining section of the lateral lobes mottled and lined. Tegmina with a longitudinal discoidal series of quadrate clove brown spots, the marginal field in the female touched proximad with apple green, and the sutural margin in the male with a touch of vinaceous-cinnamon. Limbs mottled and faintly annulate with the general colors, the caudal femora blackish in the genicular region and with the dorso-lateral face marked with several velvety seal brown spots,

one submesad and another nearer the base; caudal tibiæ dull olive with a faint proximal lighter annulus, the spines and spurs tipped with black; tarsi soiled greenish with the proximal part of the first joint, the whole second and the tip of the third blackish.

Measurements.

	♂	♀
Length of body,	17.7 mm.	21 mm.
Length of pronotum,	3.2 "	4.3 "
Length of tegmen,	14.5 "	18.3 "
Length of caudal femur,	10.7 "	13 "

A paratypic series of six females has also been examined (February 13, 15 and 27, March 17 and 21, 1905). This series shows that the species varies somewhat but not greatly in size, and the coloration presents a considerable range of base tones and finer definition of markings without much modification of such pattern as is found in the types. Two specimens are touched with green as in the ♀ type, but both have it weaker on the head and tegmina, and the lateral carinæ are broadly marked with the same tint on the metazona, and the caudal femora have distinct oblique blackish bars. Other specimens have the lighter general colors replaced by ferruginous or wood brown, giving a warm rufescent type or a rather sandy form, while the femoral bars are present as variations irrespectively of color form All the females except the type have the lateral carinæ marked with lighter on the metazona. One of the rufescent type has the dark colors all blackish, presenting a strong contrast with the other ferruginous patches.

SCYLLINÆ.

After examining individuals of all the genera of the *Scyllinæ* except *Eupnigodes* McNeill and *Zapata* Bruner, the following arrangement of the genera seems to be desirable as it appears to express their natural relations:

Boöpedon Thomas.
Euplectrotettix Bruner.
Scyllina Stål.
Eupnigodes McNeill.
Zapata Bruner.
Psoloessa Scudder.
Stirapleura Scudder.
Agencotettix McNeill.
Aulocara Scudder.
Ligurotettix McNeill.

The position of *Eupnigodes* and *Zapata* is taken from other authors, while *Ligurotettix* is placed here instead of in the *Epacromiæ*, as it is quite different from *Mecostethus* and *Epacromia*, approaching *Aulocara* in some respects. While no doubt somewhat aberrant *Ligurotettix* is clearly a member of the Scyllinæ, the intercalary vein, for example, being no stronger than is the case in many specimens of *Aulocara*.

EUPLECTROTETTIX Bruner.

1900. *Euplectrotettix* Bruner, Acc. Gen. Spec. Locusts Argent., pp. 23, 38 (*Eupletrotettix* laps. p. 38).

Included *E. ferrugineus, conspersus, schulzi* and *prasinus* Bruner, of which *ferrugineus* may be considered the type.

Euplectrotettix ferrugineus Bruner.

1900. *Euplectrotettix ferrugineus* Bruner, Acc. Gen. Spec. Locusts Argent., p. 39. [Sandy knolls about Asuncion, Paraguay; Territory of Formosa, Argentina.]

Sapucay, Paraguay. February 13, 1903; December 16, 1904; January 26, February 10–25, March 2–19, 1905. 9 ♂♂, 10 ♀♀. (Foster, Hebard Coll.)

These specimens are all larger than the measurements given by Bruner, but otherwise do not appear to materially differ. The series is quite uniform in size, and an average ♂ and ♀ measure as follows:

	♂	♀
Length of body,	18.5 mm.	25 mm.
Length of pronotum,	3.5 "	4.8 "
Length of tegmen,	15.5 "	21 "
Length of caudal femur,	11.5 "	15.2 "

Two distinct types of coloration are present, one irregularly mottled and washed with fuscous, the other with a light orange ochraceous median bar on the head and pronotum, flanked by blackish lateral lines, which are filiform on the head and broader on the pronotum. The tegmina in the latter type also possess a pair of light parallel longitudinal lines on the anal areas.

The indications of femoral bars mentioned by Bruner are quite strong in nearly all the females and several of the males examined, while the blackish genicular region of the ♂ and the orange-red abdomen of the same sex are quite striking.

SCYLLINA Stål.

187 . *Scyllina* Stål, Recensio Orthopterorum, I, p. 112.

Included *S. peragrans* (Stål) and *S. viatoria* (Saussure) of which

the former is the type, the latter having been removed to *Plectrophorus* (=*Plectrotettix*) by McNeill.

1895. *Pseudostauronotus* Giglio-Tos, Zool. Jahrb., Abth. Syst., VIII, p. 808. Type.—*P. brunneri* Giglio-Tos.
1897. *Plectrophorus* McNeill, Proc. Davenp. Acad. Nat. Sci., VI, p. 198, 251, pl. 4, fig. 21 [not of Férussac, 1819]. Included *Stenobothrus viatorius* and *gregarius* Saussure.
1897. *Plectrotettix* McNeill, Psyche, VIII, p. 71.

Of the various species here considered a series of one hundred and fifty-six specimens have been examined, including typical material of the five species described by Bruner. Thorough consideration of this material shows that no tangible characters exist for separating *Scyllina, Pseudostauronotus* and *Plectrotettix* even as subgenera as proposed by Bruner.[22] The characters on which the subdivisions were there made are: the presence or absence of an intercalary vein in the post-radial area, the cells of this region being accordingly arranged in two series or else irregularly reticulate; the caudal lobe of the pronotum either subequal to or longer than the cephalic; the inner claw of the hind tibiæ more or not more than twice the length of the outer, and the number of spines on the outer margin of the hind tibiæ (9 to 12 or 13 to 16).

The first of these characters can usually be depended upon as stable, but in this genus the intercalary vein is by no means a stable character being present or absent in individuals of the same species, and in some cases varying in an individual to the extent that it is distinct on one tegmen and absent on the other. The proportions of the lobes of the pronotum are also found to vary, as in species belonging unquestionably to the section supposed to have subequal divisions the caudal section distinctly exceeds the cephalic in length, while the reverse is the case in other species. The length and shape of the tibial claws while diagnostic when the type species alone are compared, is without value when other forms are considered; specimens of *varipes*, which is allied to *conspersa*, has the spurs no longer than is found in Mexican forms referred to *Plectrotettix*. The number of tibial spines is a character which appears unworthy of use in separating subgenera, especially when the extent of variation is such as to cause great doubt as to which division a particular specimen belongs.

While the type of the genus *Gomphocerus* (*Epacromia*) *peragrans* Stål,[23] has not been recognized since the original description, a circumstance probably due to the fact that the type locality is an unfre-

[22] *Biol. Cent.-Amer.*, Orth., II, pp. 99–100.
[23] *Kongliga Svenska Fregatten Eugenies Resa*, Zool., I, p. 343, 1860. [Puna.]

quented one, the description is such that it could be identified with little difficulty.

The name *Pseudostauronotus* was proposed by Giglio-Tos under the impression that the type, *brunneri*, was a member of the very insufficiently described genus to which Brunner applied the same name two years previously.[24] As Brunner's name rests on a description of seven words without included species or type mentioned, it is really a *nomen nudum* and as such not invalidating the later use of the name by Giglio-Tos, even when used in misapprehension. Scudder has shown[25] from the evidence of material sent him by Brunner that *Pseudostauronotus* of that author equals his much older *Stirapleura*.

Some species of the genus appear to resemble species of *Boöpedon*, others forms of *Stirapleura* and several have a striking superficial resemblance to forms of the Locustine genus *Schistocerca*. The following arrangement appears to present their relationship as clearly as possible in a linear arrangement.

Species but little variegated, the coloration rather uniform; lateral carinæ of the pronotum moderately arcuate, not prominent; superficially resembling *Boöpedon*.

Scyllina uniformis Rehn.

Scyllina instabilis n. sp.

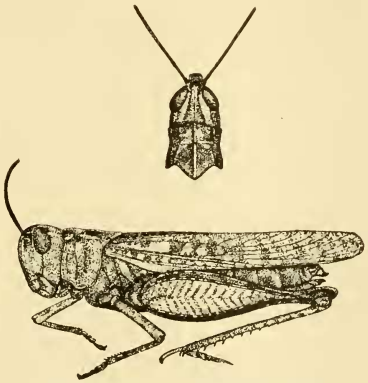
Types: ♂ and ♀; São Paulo, São Paulo, Brazil. September 5, 1900. (Adolph Hempel; No. 202.) A. N. S. Phila.

This species is closely allied to *S. uniformis*, but differs in the sharper caudal angle of the pronotum, the longer metazona of the pronotum (much longer than the prozona), the slightly narrower interspace between the eyes and the rather different type of coloration.

Size medium; form robust. Head with the fastigium broad, rounded rectangulate, depressed area crescentic, interspace between the eyes equal to the interantennal width of the frontal costa, lateral foveolæ oblong, punctate, slightly impressed; viewed laterad the fastigium rounds into the frontal costa without angle; frontal costa broad, subequal, slightly constricted above the antennæ, two rows of punctures dorsad; supplementary facial carinæ indistinct ventrad; eyes acute reniform, slightly longer than the infraocular portion of the genæ; antennæ slender, slightly depressed proximad. Pronotum with the cephalic margin arcuato-truncate, caudal margin obtuse-angulate, sharper in the male than in the female; median carina rather high, distinct, cut slightly cephalad of the middle by the

[24] *Ann. Mus. Civ. Stor. Nat. Genova*, XXXIII, p. 123, 1893.
[25] *Canad. Entom.*, XXIX, p. 76, 1897.

distinct transverse sulcus; lateral carinæ distinct cephalad and caudad, subobsolete mesad with the constriction slight; lateral lobes slightly over half as deep again as long, cephalic and caudal margins subparallel, ventral margin rounded obtuse-angulate. Tegmina distinctly (♂) or moderately exceeding the apex of the abdomen, but only slightly exceeding the tips of the caudal femora; costal expansion slight, ow, apex rotundato-truncate; postradial area irregularly areolate. Cephalic and median limbs rather slender. Caudal femora robust, inflated, the distal portion slenderer and with the pregenicular portion constricted, carinæ strongly ribbed, pattern of the pagina distinct and regular; caudal tibiæ with eleven spines laterad, longer internal spur slightly more than twice the length of the shorter, sharply curved distad but not distinctly hooked.



Figs. 14 and 15.—*Scyllina instabilis* n. sp. Female type. Dorsal view of head and pronotum and lateral view. (× 1½.)

General color ranging from ochraceous-rufous (male) to dull hazel and clay color (female). Head with a blackish postocular bar distinct in the male, slight in the female; infraocular line very distinct in the male, absent in the female; lateral margins of the frontal costa and ventral portion of the lateral foveolæ lined with blackish, more distinct in the male than in the female; face and sides of the head blotched with a darker brown in the female; eyes rather cinnamon in the male, pale isabella color in the female; antennæ of the general color. Pronotum of the male clear ochraceous-rufous, with the lateral carinæ slightly marked cephalad, the lateral lobes with a broad

blackish bar extending from the principal transverse sulcus dorsad obliquely ventrad to the ventro-cephalic angle; of the female with a dorsal cross imperfectly indicated by dull hazel on a clove brown ground, lateral lobes reddish clay color with weak longitudinal blotches of broccoli brown. Tegmina with the anal area obsolete maculations in both sexes, those of the female more distinct than those of the male, remainder with rather narrow rather regularly disposed transverse bars of clove brown, which are weaker distad than proximad in the female, but uniform in strength in the male. Limbs cream buff marked with clove brown; caudal femora cream ochraceous-rufous dorsad in the male, not barred, in the female hazel with four rather weak transverse bars of dull brown, carinæ of the lateral face dotted with blackish, the pattern of the pagina outline in brownish; ventral face very dark verditer blue; caudal tibiæ ranging from orange-vermilion (male) or chinese orange (female) proximad to maroon purple (male) or burnt carmine (female), spine blackish at the tips.

Measurements.

	♂	♀
Length of body,	24.5 mm.	33 mm.
Length of pronotum,	5.4 "	6.2 "
Length of tegmen,	23 "	28.5 "
Length of caudal femur,	18.3 "	21.3 "

In addition to the types a paratypic series of five males (September 5 and 14, 1900) have been examined. Considerable color variation is presented by this series, which is roughly divisible into three types; one (*a*) with the dorsum of the pronotum unicolorous, which is represented by the type alone, another (*b*) with a rather pale median pronotal line flanked laterad by blackish, represented by three individuals, and a third (*c*) with a pronotal cross as in the ♀ with the caudal margin of the pronotum as pale as the cross, represented by two specimens. The median pale line is distinctly carried to the tips of the tegmina in one of type *b*, while the transverse tegminal bars are rather regular and distinct, though not complete in some specimens; a pale proximal tegminal line is present in two individuals of type *b*. The dorsum of the caudal femora is distinctly barred in both of type *c*, and faintly in one of type *b*, while the lateral face shows distinct oblique bars in several specimens. The color of the caudal tibiæ in all males other than the type is as in the ♀ type. A single ♂ specimen from Sapucay, Paraguay (III 9.05; Foster, No. 195 part), in the Hebard Collection, is referred to this species. It presents a rather different appearance

when compared with the typical series, but the differences are wholly of color. The dorsum of the pronotum is to a large extent velvety black, broken at the sulci, while the lateral carinæ are marked as in specimens of type *c*, but darker, with the median longitudinal bar present.

Scyllina picta (Bruner).

1900. *P[lectrotettix] pictus* Bruner, Acc. Genera Spec. Locusts Argent., p. 37, fig. 13. [Cordoba and Sante Fé Provinces, Carcaraña and Rosario, Argentina.]

A topotypic series of three males and three females from Carcaraña, collected by Bruner, have been examined.

This species is only known from Cordoba and Sante Fé Provinces, Argentina.

Scyllina brunneri (Giglio-Tos).

Sapucay, Paraguay. February 13, 1905. 1 ♂. (Foster, Hebard Coll.)

This specimen is considerably darker than any strongly marked specimen of this species seen. The whole insect is quite dark except for the light femoral bars, but the pattern is still distinctly visible, the medio-dorsal and lateral bars being present, and the tegminal streak clear apple green. The size of this specimen is slightly greater than Matto Grosso specimens.

Scyllina pratensis (Bruner).

1904. [*Plectrotettix*] *pratensis* Bruner, Biol. Cent.-Amer., Orth., II, p. 100. [Pernambuco, Brazil.]

Paratypic specimens, a ♂ and ♀, of this species, loaned by Prof. Bruner, have been examined. They differ from *brasiliensis* in the slightly smaller size, rather slenderer form, less divergent carinæ of the pronotum and the more acute fastigium. The color of the caudal tibiæ is of little diagnostic value, as in other species of the genus, the male in hand having them wholly red, the female ochraceous with the dorsal surface purplish distad and reddish proximad.

Measurements of paratypes.

	♂	♀
Length of body,	20.2 mm.	26.5 mm.
Length of pronotum,	4 "	5 "
Length of tegmen,	18.5 "	23.5 "
Length of caudal femur,	15 "	17.5 "

Scyllina gregaria (Saussure).

1861. *St[enobothrus] gregarius* Saussure, Revue et Magasin de Zoologie, 2e sér., XIII, p. 318. [St. Thomas; Haiti.]
1903. *Plectrotettix gregarius* Rehn, Trans. Amer. Entom. Soc., XXIX, p.

133. [Utuado, Arroyo, Bayamon and Mayaguez, Porto Rico; Culebra and Vieques Islands.]

A ♀ from Vieques Island has been examined in this connection. The species is closely related to *pratensis*, but differs in the narrower space between the eyes and the greater interantennal constriction of the frontal costa. It is interesting to note that the known ranges of these very closely related species are separated by a distance of over two thousand miles, in the land areas of which, as far as at present known, no species of the genus is found.

Scyllina brasiliensis (Bruner).

1904. [*Plectrotettix*] *brasiliensis* Bruner, Biol. Cent.-Amer., Orth., II, p. 100. [Southern Brazil.]

Sapucay, Paraguay. 1 ♂, 1 ♀. Prof. Bruner's Coll. Sapucay, Paraguay. January 28, February 2–27, March 6–10, 1905. 11 ♂♂, 20 ♀♀. (Foster, Hebard Coll.) São Paulo, São Paulo, Brazil. September 1–14, 1900. 4 ♂♂, 6 ♀♀. (Hempel, A. N. S. P.)

The Sapucay specimens loaned by Prof. Bruner are marked as types, although the locality southern Brazil is given with the original brief description.

The variation in the intensity of the markings of this species is quite considerable. The males appear to be, for this genus, rather uniform in coloration, and the variation in size is not very great. The females, however, vary greatly in the amount and shade of green coloring, some having the dorsal face of the caudal femora, head and the greater portion of the pronotum and pleura rather pale apple green, while others have these parts mottled and overlaid more or less strongly with dull brown. In a few specimens the green, except the tegminal bar, is wholly replaced with a shade of brown, but in such cases the pattern remains the same. In the material examined but very few specimens have the characteristic pattern obscured and even in those cases it is not obliterated.

As a series the females are quite uniform in size, one Sapucay female, however, being quite large. This latter individual is also very deeply colored.

The measurements of Bruner's Sapucay specimens and the large ♀ mentioned above are as follows:

	Bruner. ♂	Bruner. ♀	Large. ♀
Length of body,	23.5 mm.	30.3 mm.	34.5 mm.
Length of pronotum,	4.5 "	6 "	6.7 "
Length of tegmen,	21 "	26.8 "	29.5 "
Length of caudal femur,	15 "	20 "	22.3 "

The records of this species given above cover the known region, from São Paulo, Brazil, to western Paraguay.

Scyllina conspersa (Bruner).

1904. [*Plectrotettix*] *conspersus* Bruner, Biol. Cent.-Amer. Orth., II, p. 100 [No locality.]

Sapucay, Paraguay. December 17, 1901; December 16, 1904. January 26 and 28, February 8–15, 1905. 9 ♂♂, 11 ♀♀. (Foster, Hebard Coll.)

Through the kindness of Prof. Bruner I have before me the type of this species, a ♀ from Sapucay, Paraguay. From the material in hand it appears that this species has several color forms, as in *brunneri* and other species. The type has the dorsal surface of the head and pronotum uniform wood brown without cruciform markings or longitudinal median stripe, and a majority of the females and several of the males examined belong to this type. Several males and females have the dorsum dark with weak, but distinct, cruciform pronotal markings and a longitudinal light bar of variable prominence, in some cases absent. In about half the specimens the heavy blackish markings on the lateral lobes of the pronotum and caudad and ventrad of the eyes are distinct, while the dorsal bars of the caudal femora are distinct in the greater number, weak and interrupted in several others including the type, dorso-lateral carina of the femora marked ventrad with blackish in all specimens, very distinct in some, broken and faint in others, the genicular lobes also blackish.

Measurements of the type.

Length of body,	34.7 mm.
Length of pronotum,	6.9 "
Length of tegmen,	32.2 "
Length of caudal femur,	22.5 "

Scyllina suffusa Rehn.

Scyllina varipes (Bruner).

1905. *Plectrotettix varipes* Bruner, Entom. News, XVI, p. 214. [Sapucay, Paraguay.]

Sapucay, Paraguay. March 5 and 15, 1905. 4 ♂♂, 5 ♀♀. (Foster, Hebard Coll.)

These specimens have been compared with typical individuals kindly loaned by Prof. Bruner. This species is very richly colored and one of the more easily recognized forms, the distinct femoral bars and the entirely black genicular region being quite striking in all the specimens examined. Considerable superficial resemblance exists to *S. conspersa*, which is found in the same locality, but the angle of the

face and the shorter and heavier caudal femora, as well as the color of the caudal tibiæ, serve to separate it without difficulty. In the case of this species and *S. conspersa* the colors of the tibiæ appear to be constant, all the specimens of *conspersa* examined having the distal section dark bluish, while the deep rich crimson of the distal two-thirds of *varipes* is clear and uniform in the whole series.

Scyllina smithi Rehn.

Scyllina borellii Giglio-Tos.

Scyllina schistocerooides Rehn.

Scyllina viatoria (Saussure).

Specimens recorded by the author as this species from Texolo, La Joya, San Luis Potosi and Alta Mira, Tamaulipas, when re-examined in the light of recent work on the Mexican and Central American forms of the genus, prove to represent true *viatoria*. The males have the dorsal face of the caudal femora distinctly barred, while the females have these parts almost uniform green.

Scyllina calida (Bruner).

1904. *Plectrotettix calidus* Bruner, Biol. Cent.-Amer., Orth., II, p. 101 [Cuernavaca, Morelos and Guerrero, Mexico, Nicaragua, Costa Rica.]

Previous records of the author of *viatoria* from Cuernavaca, Uruapan, Gualajara, Zapotlanejo and Zapotlan should be referred to this species.

The range of variation in size and coloration in this form is very great, some individuals having the colors weak and poorly defined, while other individuals from the same locality are quite richly colored. The width, number and intensity of the transverse bars of the tegmina also varies greatly as in some individuals they are as broad as the intervening sections, while in others they are broken, imperfect and rather pardaline in character and distribution.

Scyllina excelsa (Bruner).

1904. *Plectrotettix excelsus* Bruner, Biol. Cent.-Amer., Orth., II, pp. 101–102. [Tlalpam and Tacubaya, Mexico.]

A male and two females of this species from Tacubaya show that this is probably the most striking Mexican species. These individuals have been previously recorded by the author as *viatoria*. The rather short tegmina, more robust form and heavier caudal femora will assist in separating this from the allied species. These specimens show practically no green, the light shades being ochres.

PSOLOESSA Scudder.

1875. *Psoloessa* Scudder, Proc. Boston Soc. Nat. Hist., XVII, p. 512

Included *P. texana, ferruginea* and *maculipennis* Scudder, of which *maculipennis* can be considered the type.

Psoloessa maculipennis Scudder.

1875. *Psoloessa maculipennis* Scudder, Proc. Boston Soc. Nat. Hist., XVII, p. 513.

San Luis Potosi, Mexico. August 5, 1903. 1 ♀. (M. E. Hoag, A. N. S. P.)

This species has been recorded from Texas, New Mexico, Arizona and California.

Psoloessa buddiana Bruner.

1889. *Psoloessa Buddiana* Bruner, Proc. U. S. Nat. Mus., XII, p. 61, t. I, fig. 6. [Carrizo Springs, Southwest Texas.]

Zapotlan, Jalisco, Mexico, July 7, 1902. ♂, ♀. (C. H. T. Townsend, A. N. S. P.)

These specimens are referred here with some little doubt. The species has been recorded from Montelovez, Coahuila.

STIRAPLEURA Scudder.[26]

1876. *Stirapleura* Scudder, Ann. Rep. Chief of U. S. Engineers, 1876, pt. 3, p. 510.

Type.—*Stirapleura decussata* Scudder.

Specimens of all the South American forms of this genus have been examined and the species are here listed to show their relationship.

Stirapleura variabilis Bruner.

Stirapleura signatipennis (Blanchard).

1851. *Œdipoda signatipennis* Blanchard, in Gay, Hist. Fis. y Polit. de Chile, Zool., VI, p. 79. [Coquimbo, Chili.]

Penco, Chili. December, 1903. 7 ♀♀. (C. S. Reed, A. N. S. P.) Concepcion, Chili. 1 ♀. (C. S. Reed, A. N. S. P.)

These specimens fully agree with Blanchard's original description. This is the largest species of the genus, exceeding even the North American *S. decussata*. An average ♀ measures as follows:

Length of body,	25 mm.
Length of pronotum,	4.8 "
Length of tegmen,	19 "
Length of caudal femur,	16.5 "

Stirapleura bruneri n. n.

1900. *S[tirapleura] signatipennis* Bruner (not *Œdipoda signatipennis* Blanchard), Gen. Sp. Locusts Argent., p. 34. [Argentina from the Pampa Central and extending into Uruguay to the eastward.]

This species is quite distinct from *signatipennis* Blanchard, as six

[26] Saussure's *Stenobothrus chilensis* (*Revue et Magasin de Zoologie*, 2e sér., XIII, p. 319, 1861) is no doubt a member of this genus, and possibly the male of *signatipennis*, the female being the only sex known to the author. The size given by him (length with elytra 15 mm.) is much too large for the male of *humilis*.

specimens from Carcaraña, Argentina, determined by Bruner show. The Argentine form is smaller, with the lateral carinæ of the pronotum more constricted and the coloration more variable than in *signatipennis*. This is apparently one of the species on which Brunner erected his insufficiently characterized *Pseudostauronotus*,[27] as specimens received from Saussure from Buenos Ayres bear the manuscript name *Pseudostauronotus occidentalis*.

Stirapleura humilis (Blanchard).

1851. *Œdipoda humilis* Blanchard, in Gay, Hist. Fis. y Polit. de Chile, Zool., VI, p. 79. [Coquimbo, Chili.]

Penco, Chili. November and December, 1903, and February, 1904. 17 ♂♂, 16 ♀♀, 5 immat. (C. S. Reed, A. N. S. P.) Concepcion, Chili. November and December, 1903, and February, 1904. 20 ♂♂, 7 ♀♀, 3 immat. (Reed, A. N. S. P.) Coronel, Chili. January, 1904. 1 ♂. (Reed, A. N. S. P.) Longuen, Chili. February, 1904. 2 ♂♂, 4 ♀♀. (Reed, A. N. S. P.) Guiltio, Chili. December, 1903. 2 ♂♂, 6 ♀♀. (Reed, A. N. S. P.) Lota, Chili. October, 1903. 1 ♂. (Reed, A. N. S. P.)

This large series exhibits a very great amount of individual variation in size and color. The females range in total length from 13 to 20 millimeters, the males varying proportionately. The color ranges from a mottled black-brown and gray with femoral bars and weakly lateral carinæ of the pronotum, to another with the general color pale with broad dark lateral bars on the dorsum of the head and pronotum with a broad pale median bar, a longitudinal dark bar on the tegmina flanked toward the costa by a pale green line, and the femora with bars and suffused along the dorso-lateral carinæ with blackish. The latter type has the markings of the lateral lobes of the pronotum quite distinct and the genicular regions of the caudal femora and tibiæ are paler than in the other type, in which these portions are blackish. These differences are irrespective of locality and date, and are connected by dozens of intermediates.

This species appears to fit Blanchard's form, some specimens agreeing very well with the rather vague description. It is apparently a common species.

Stirapleura pallida Bruner.

Stirapleura obscura Bruner.

The position of this species is a little doubtful. In some respects it resembles *bruneri*, but its general characters approach *brunnea*.

Stirapleura brunnea Rehn.

[27] *Ann. Mus. Civ. Stor. Nat. Genovâ*, XXXIII, p. 123, 1893.